Third United Nations International Conference on the Peaceful Uses of Atomic Energy

A/CONF.28/A/446
BELGIUM
February 1964
Original: FRENCH

Confidential until official release during Conference

Abstract

STUDY OF THE BR2 NUCLEAR CHARACTERISTICS BY MEANS OF ITS MOCK-UP BR02.

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Work performed by the Association C.E.N.-EURATOM for the exploitation of the BR2 reactor and its auxiliary installations. (Contract 006/60/5 BRAB.)

The determination of the nuclear characteristics of the materials testing reactor BR2 is founded essentially on the measurements made in the reactor BR02, the nuclear mock-up of BR2.
The correlation between the two systems, as is described, is based upon a correct forecast of the BR2 behaviour from the tests conducted in BR02.

The increase to full power operation of BR2 has been executed in two stages, one in 1962 and the other in 1963; prior to this, an experimental study has been made in BR02 on the selected core configuration of fourteen fuel elements. This study is presented briefly; it deals

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with the following items : macroscopic flux distributions, fine flux structure, neutron spectra, reactivity value of fuel and poison, reactivity worth of control rods. This information allows to establish by calculation the reactivity balance and the associated control rods shift at any time during the BR2 high flux operation and also contributes to the knowledge of the hot spot factors.

The observations and measurements done in BR2 allow one to verify the established forecasts, and more particularly to evaluate the validity of some simulation models adopted in BRO2. The measurements carried out in BR2 during the high power operation periods and at low power level, during the reactor shut-downs, are described; they lead to the determination of the reactor characteristics evoluation during fuel burn-up : excess of reactivity, flux levels, neutron and gamma heating distributions, neutron spectra and fine flux structure; more particularly and in accordance with one of the more important objectives of the tests, the highest reached operation level, expressed in terms of maximum heat flux, can be deduced.